

Serial No. 10/615,973

### **Amendments to the Claims**

#### Claims

1. (currently amended) A surgical instrument, comprising:

a shaft comprising a frame, a firing member supported by the frame configured to ~~independently~~ transfer an actuating motion, and comprising an articulation drive tube encompassing the frame and firing member and configured to transfer a rotational motion about a longitudinal axis thereof;

a handle portion proximally attached to the frame and coupled to the shaft operably configured to produce the actuating motion and the rotational motion;

an end effector distally, pivotally attached to the frame for arcuate articulation and responsive to the actuating motion; and

~~an~~ a gear train articulation mechanism responsive to the rotational motion to articulate the end effector in a plane ~~from~~ bisected by the longitudinal axis of the shaft, comprising:

a spur gear attached to the end effector and aligned in an arc proximal to and equidistant from a pivot axis of the pivotal coupling of the end effector, and

a gear section presented about at least a portion of a distal end of the articulation drive tube communicating the rotational motion to the spur gear of the pivotal coupling of the end effector.

2. (original) The surgical instrument of claim 1, wherein the end effector comprises a stapling and severing mechanism, wherein the actuating motion comprising a longitudinal firing motion and the stapling and severing mechanism is further responsive to a longitudinal closing motion, the handle portion and shaft configured to produce and transfer the firing and closing motions.

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3. (original) The surgical instrument of claim 2, wherein the shaft includes a closure member responsive to the longitudinal closing motion and pivotally coupled to the end effector, the shaft further includes a firing bar and a frame supporting the firing bar figured to transfer the firing motion to the end effector, the articulation mechanism including an articulation drive tube communicating the rotational motion to the pivotal coupling of the end effector.

4. (original) The surgical instrument of claim 3, wherein the pivot coupling comprises a pair of distally projecting, laterally opposed posts extending from the closure member respectively coupled to a pair of proximally projecting, laterally opposed pivot points extending from the end effector.

5. (original) The surgical instrument of claim 3, wherein the articulation mechanism comprises:  
a means for pivotally coupling the end effector to the shaft;  
a gear means for converting the rotational motion of the articulating drive tube to an articulation motion of the end effector.

6. (canceled)

7. (currently amended) ~~A~~ The surgical instrument of claim 6, comprising:

a shaft configured to independently transfer an actuating motion, and a rotational motion about a longitudinal axis thereof;

a handle portion coupled to the shaft operably configured to produce the actuating motion and the rotational motion;

an end effector responsive to the actuating motion; and

an articulation mechanism responsive to the rotational motion to articulate the end effector in a plane from the longitudinal axis of the shaft;

wherein the shaft further comprises an articulation drive tube responsive to the rotational motion from the handle portion and distally terminating in a gear section, the articulation mechanism comprising a spur gear proximally attached to the end effector and engaged by the gear section;

wherein the articulation drive tube further comprises a second gear section proximally recessed with respect to the first gear section, the end effector further comprises a proximally projecting gear section laterally opposite the spur gear, the surgical instrument further comprising a reversing gear engaged between the second gear section and the proximally projecting gear section.

8. (currently amended) The surgical instrument of claim ~~[[6]]~~ 1, wherein the gear section and the spur gear form a bevel gear connection.

9-11. (canceled)

12. (currently amended) A surgical instrument, comprising:

- a handle portion operably configured to produce a rotational motion;
- a shaft having a longitudinal axis and comprising:
  - an elongate frame attached to the handle portion,
  - an articulation drive tube encompassing the elongate frame and responsive to the rotational motion, and
  - a gear section distally projecting about at least a portion of a circumference of a distal end of the articulation drive tube;
- an end effector pivotally coupled to the shaft at a pivot axis; and
- a spur gear on the pivot axis, proximally attached to the end effector and engaged to the gear section to convert the rotational motion of the articulation drive tube to an articulation motion pivoting the end effector in a plane from the longitudinal axis of the shaft.

13. (currently amended) A The surgical instrument of claim 12, comprising:

- a handle portion operably configured to produce a rotational motion;
- a shaft having a longitudinal axis and comprising:
  - an elongate frame attached to the handle portion,
  - an articulation drive tube encompassing the elongate frame and responsive to the rotational motion, and
  - a gear section distally projecting about at least a portion of a circumference of a distal end of the articulation drive tube;
- an end effector pivotally coupled to the shaft at a pivot axis; and
- a spur gear on the pivot axis, proximally attached to the end effector and engaged to the gear section to convert the rotational motion of the articulation drive tube to an articulation motion pivoting the end effector in a plane from the longitudinal axis of the shaft;

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wherein the articulation drive tube further comprises a second gear section proximally recessed with respect to the first gear section, the end effector further comprises a proximally projecting gear section laterally opposite the spur gear, the surgical instrument further comprising a reversing gear engaged between the second gear section and the proximally projecting gear section.

14. (canceled)

15. (original) The surgical instrument of claim 12, wherein the gear section of the articulation drive tube comprises a beveled gear section, and the spur gear comprising a beveled spur gear.

16-22. (canceled)